January to March 2024 Outlook: Perspective for the Lower Rio Grande Valley/Deep S. Texas Region

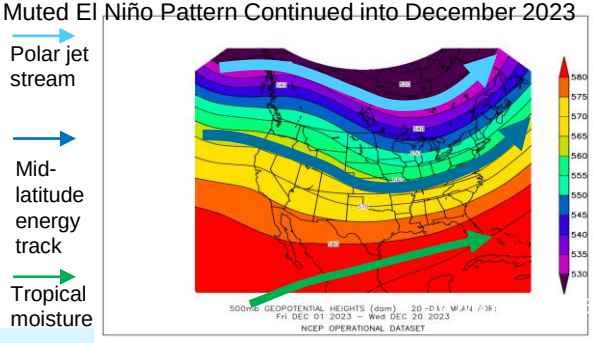
NATIONAL WEATHER SERVICE

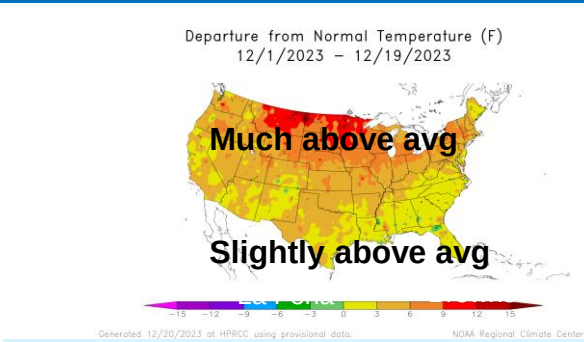
December 22, 2023

Barry Goldsmith, NWS Brownsville/Rio Grande Valley, Texas

December was "Copacetic". Will Late Winter/Early Spring Be the Same?

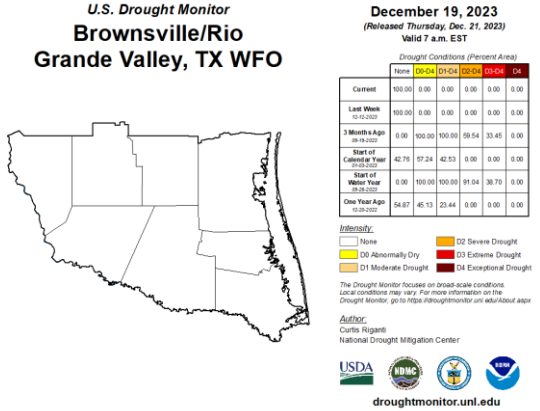
Muted El Niño Pattern Continued into December 2023

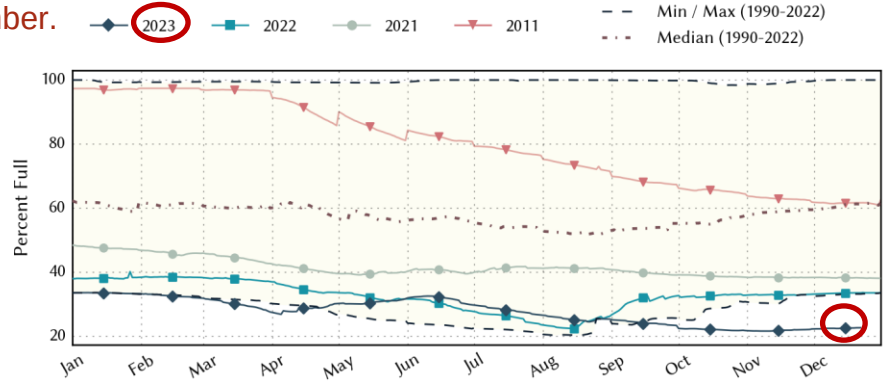




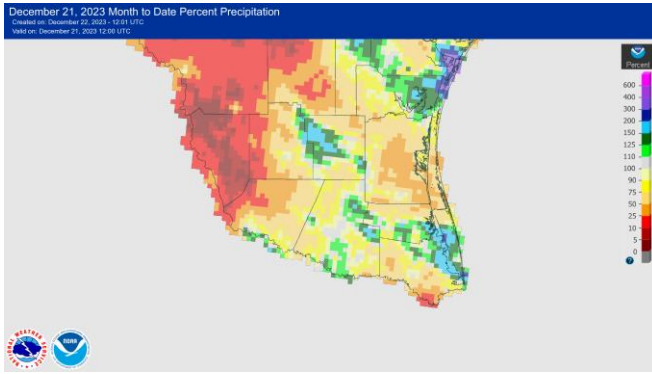
December 2023: Mix of Dry and Wet; Slightly Warmer

- **El Niño's** pattern was muted a bit – though a mid-month central Gulf cyclone helped produce a minor coastal flood and led to damaging winds and flooding rains along the east
- **Drought (right) was removed by additional light to moderate rain events at the end of November and mid December.** The combination of soil moisture rises from the rain and low evaporation rates (cloud cover and general moistness) ended all dryness by early December.
- Despite the Valley soil moisture (still not sufficient in the long run), inflows from runoff farther north in Texas and tributaries that feed the Rio Grande provided small rises to Falcon, with continued slow falls at Amistad. The Texas share of conservation along the Rio Grande **remained at record** low levels for late December.



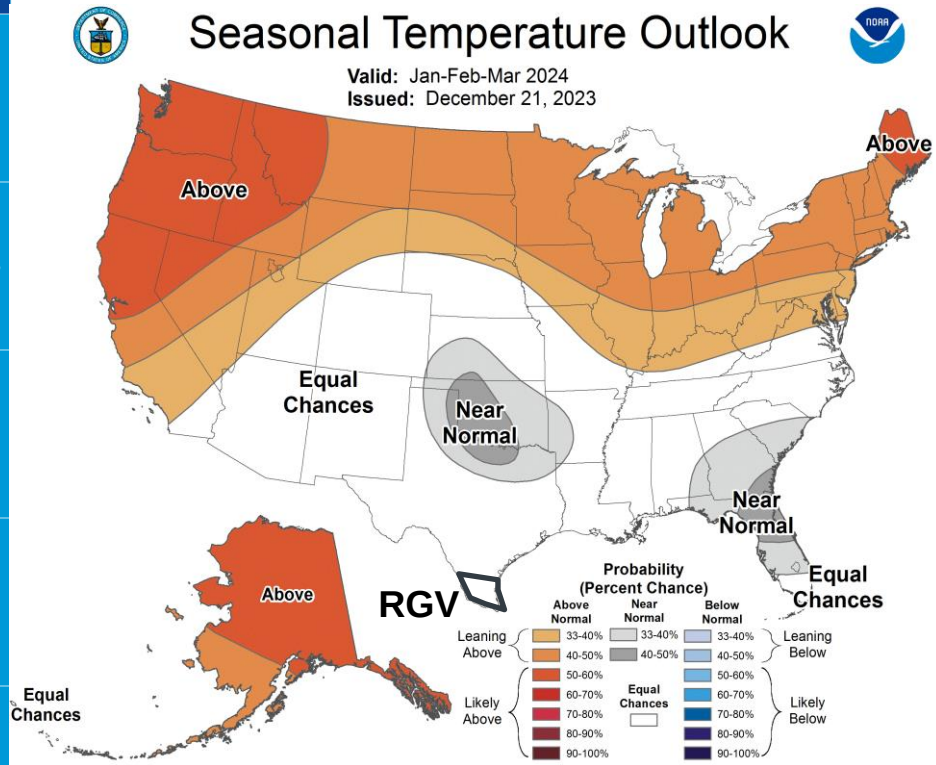


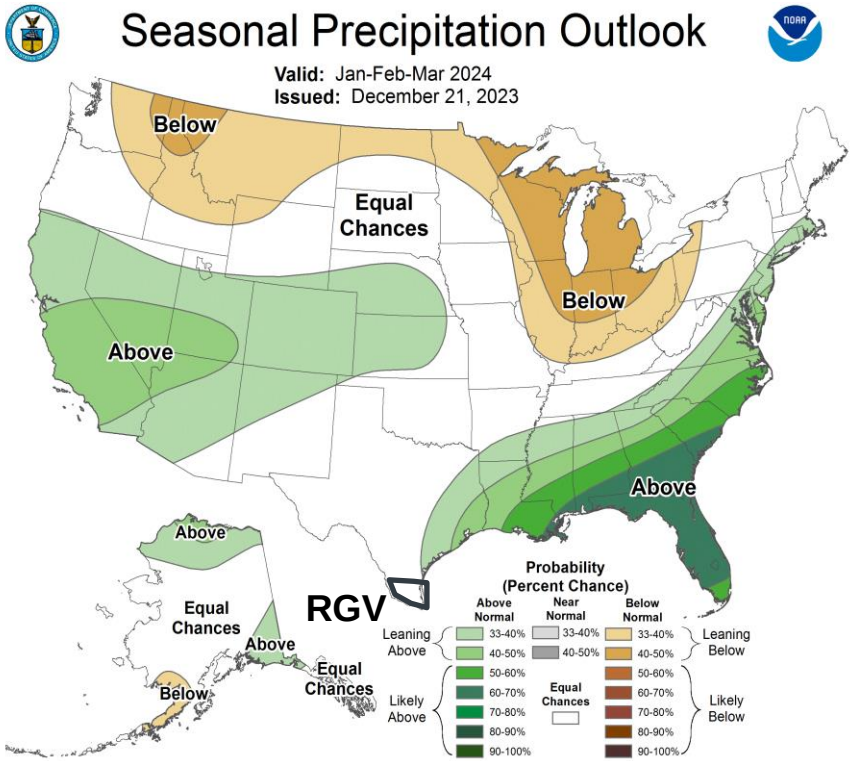
Texas share of Amistad, Falcon, Red Bluff Reservoirs.
Credit: Texas Water Development Board



December 1-21 percentage of average rainfall. Generally near average for the Valley/Coastal Plain but below average for Brush Country/Rio Grande Plains.

Seasonal Forecast, January – March 2024 USA





Key Takeaways: January – March 2024

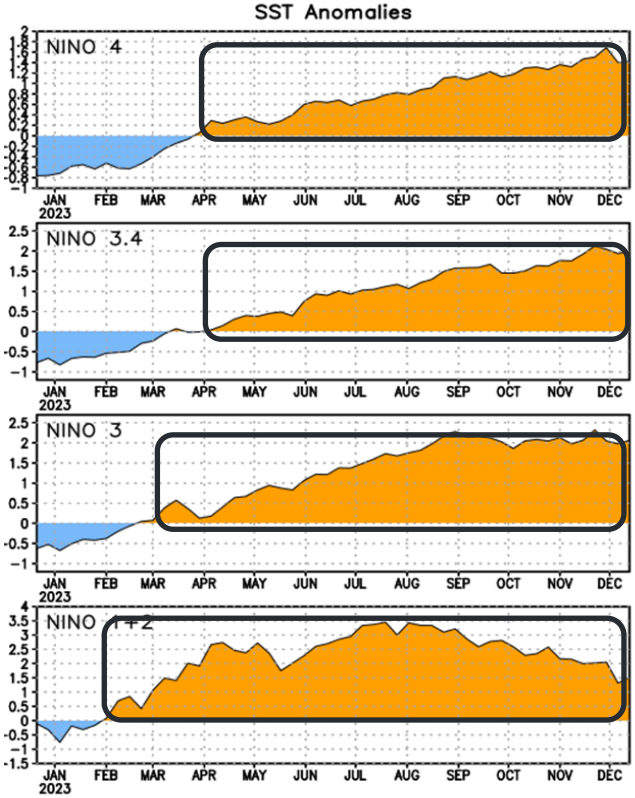
- Confidence is **medium** on rainfall outcomes, and **medium** on temperature outcomes. There is still some uncertainty on the prevailing (average) signal that could enhance rainfall, or hold it back, despite the strong El Niño. Confidence is also **medium** on **dryness or possible moderate drought** redevelopment by late winter/early spring and beyond. Additional light to moderate rain events similar to November through mid December would keep drought/dryness out.
  - Reservoir levels at Falcon nudged upward in December, but only slightly above **record lows for these dates** – values not seen since late November 2002. Inflows from additional rainfall would slowly increase reservoir levels; conversely, dry and warm periods could maintain modest evaporation rates through February. Amistad, and the Rio Grande overall, remain at record seasonl lows. **Confidence is high on levels remaining well below average through winter**.
  - El Niño influences combined with other "teleconnections" between oceans and atmosphere will **determine the eventual "sense" of winter**. There are slightly increased chances for **helpful rains** for the Valley's detention/drainage system – less for the reservoir inflow region – and still a reasonable chance (33 percent) for **renewed dryness**. Confidence is **medium** on either outcome.
  - **Stage 2 and 3 water conservation continued in more than a half-dozen RGV municipalities in late November. Status quo is likely through March,** and could worsen if March is dry and warm**.**
  - **Will it freeze?** While cold fronts of the "gray, drizzly" variety are expected several times through February, a hard freeze (≤27°F) remains unlikely. Between **one and three freezes** may occur after January 5, (highest chances across the Brush Country) and **low wind chill** (**apparent temperature at or below 30ºF**) **may occur one to three times as well**.
  - Wintry precipitation (ice or snow) is very unlikely, but a **non-zero chance** exists through mid February.
  - **Severe Weather (hail, wind, flooding)** could arrive in March, but confidence is low.

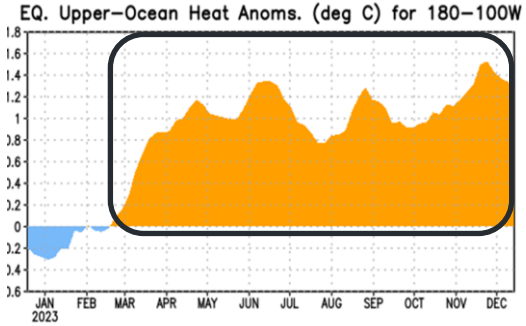
The "Why" of the Forecast:
El Niño to remain strong; somewhat uncertain winter/early spring temperatures

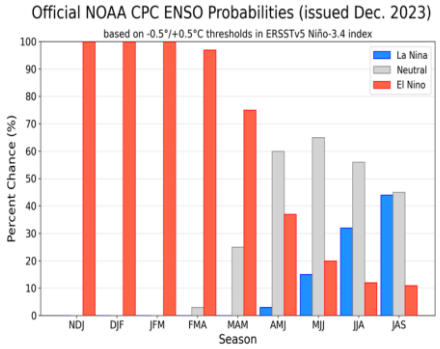
Year	DJF	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ
2021	-1.0	-0.9	-0.8	-0.7	-0.5	-0.4	-0.4	-0.5	-0.7	-0.8	-1.0	-1.0
2022	-1.0	-0.9	-1.0	-1.1	-1.0	-0.9	-0.8	-0.9	-1.0	-1.0	-0.9	-0.8
2023	-0.7	-0.4	-0.1	0.1	0.5	0.8	1.1	1.3	1.6	1.8		

- El Niño maintained an active subtropical jet in December, but other atmospheric systems did not "utilize" it for heavy rainfall in much of Texas. Florida was the jackpot for El-Niño-related rainfall.
- Should heavy rainfall events reappear – most likely from mid February through March if the pattern sets up favorably – **this could help local water supplies.**
- An infrequent pattern like November 10-14 – or return to relative dryness – would eventually bring abnormal dryness or even moderate drought back to some areas.

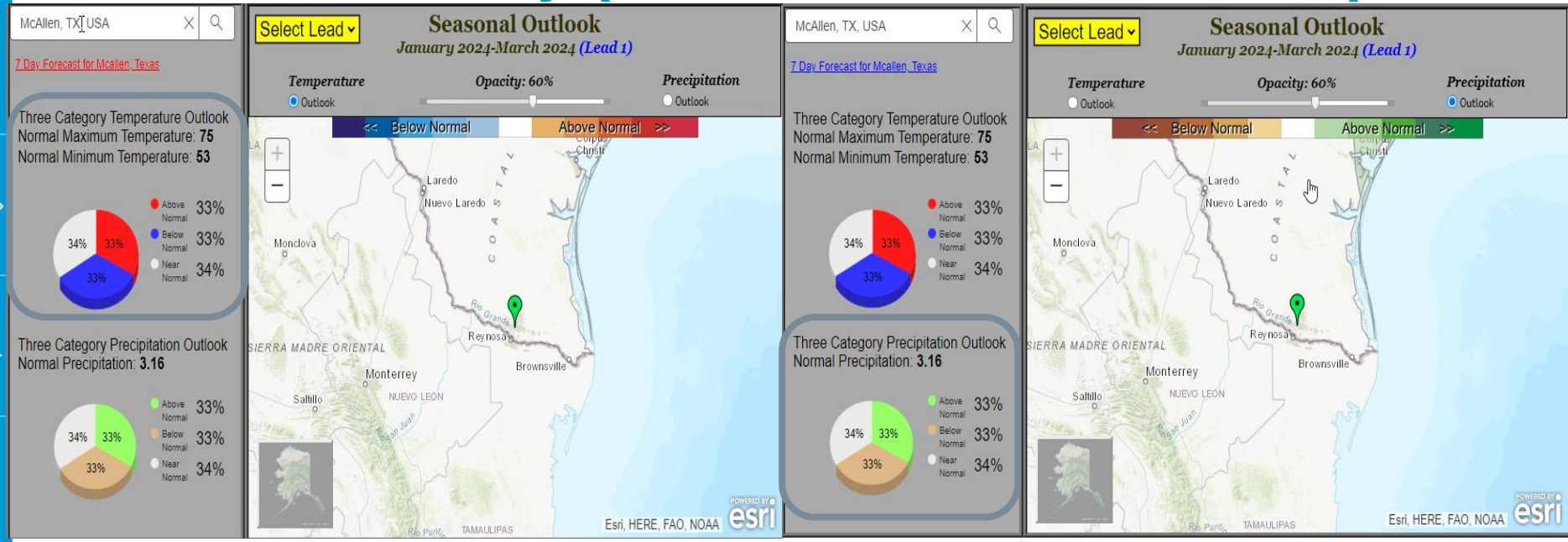
*Above right: Oceanic Niño Index. Values below -0.5 (**light blue**) for five consecutive 3-month periods indicated La Niña. El Niño (**red,** +0.5) officially began in April-June 2023, reached strong levels (1.5) by August-October 2023, and strengthened further for September-November.





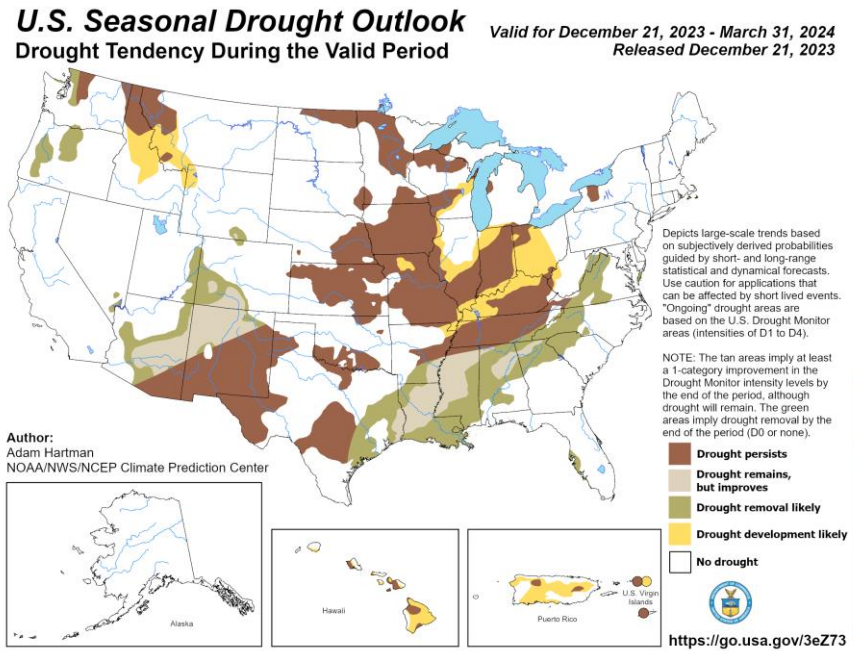


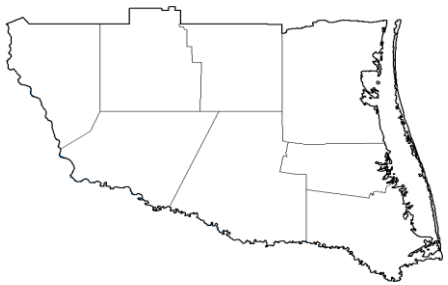
The January-March 2024 Outlook: Rio Grande Valley (McAllen as Anchor Point)



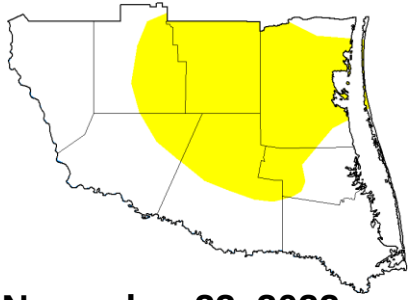
- Temperature: **Equal chances for above, below, and average**: RGV averages: Afternoon 70-lower 70s in early January, rising to the low to mid 80s by late March. Morning: 47 to 52 through the end of January, rising to the low to mid 60s by the end of March.
- Precipitation: **Equal chances for above, below, and average**. RGV averages: 3 to 4.25 inches (from west to east).

The January-March 2024 “Droughtlook”

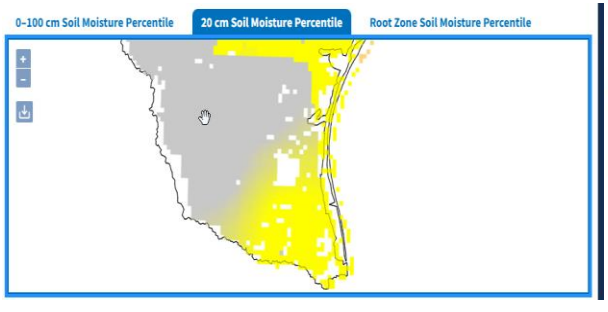




December 21, 2023

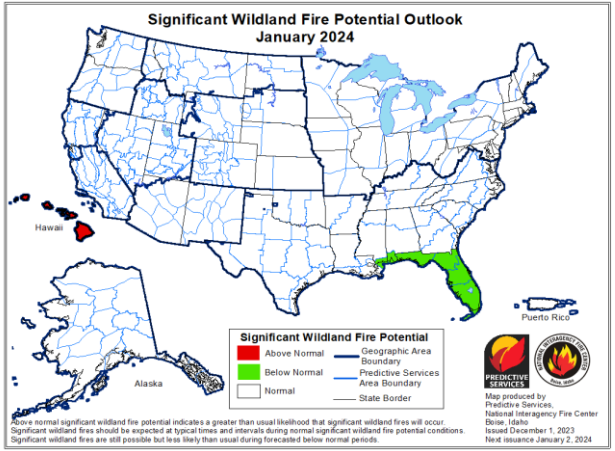


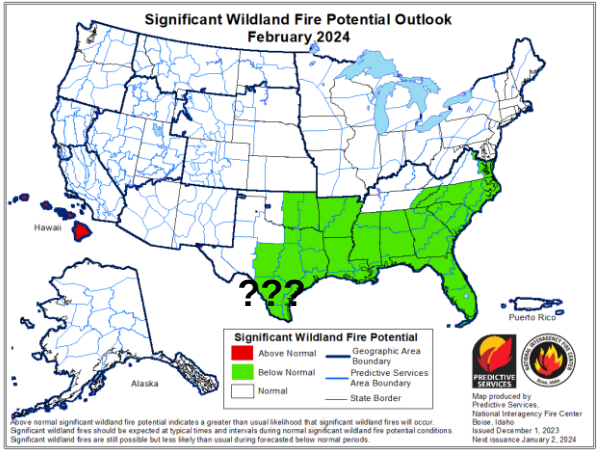
November 22, 2022

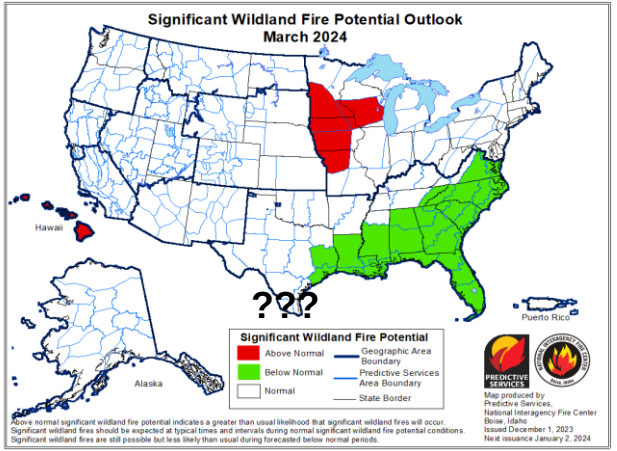


- **Dryness was removed in early December.** However, 4” (depth) Soil moisture was a mixed bag at the end of December, with the lower Valley in a 20-30% of average zone. This is not necessarily unusual for parts of the region in early winter.
- **Winter remains uncertain** as upper level disturbances may bring occasional “coverage” rain events with fronts and/or tropical moisture feeds**. If persistent rain falls**, dryness/drought will not return. If **rains are fleeting**, and post-frontal dry and warm weather returns, abnormal dryness and even moderate drought (level 1 of 4) could return, most likely in February or March.

Wildfire Spread Potential Should Remain in Check in early 2024



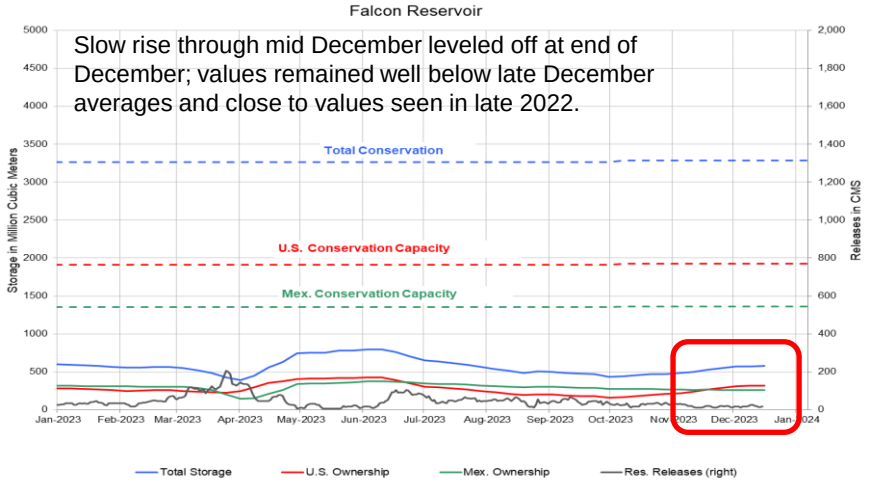


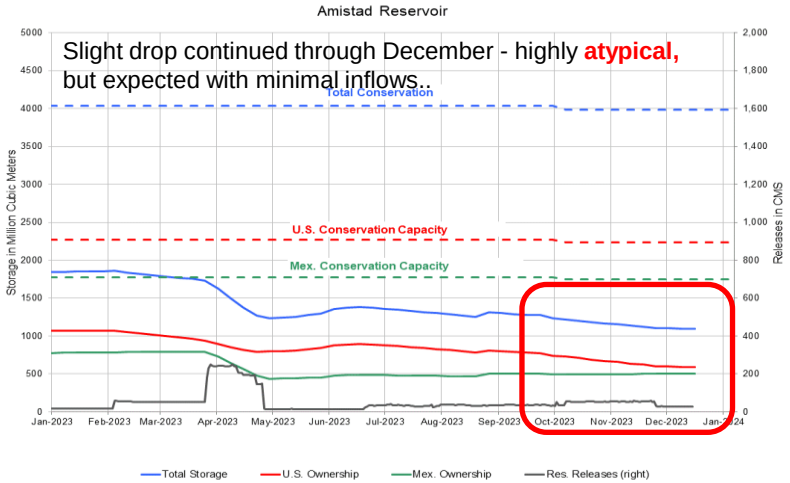


- **Low to moderate grass fuel loads are common** across many areas, despite **full green-up** following November rains (lower sun angle/relative dormancy)
- **No issues are expected in January** due to continued low evaporation and a forecast for mainly “seasonable” temperatures and rainfall.
- While the forecast shown indicates **below average fire spread potential** in February, **uncertainty is low to medium on this outcome** and based on additional rainfall and average temperatures with limited drying. There are **equal chances that February could be warmer and drier than average, which would change this forecast**. March follows suit. Any dryness/drought in March, combined with wind and warmth, could **nudge potential to above average**.

Dewy, green morning in east Brownsville, Dec. 16, 2023

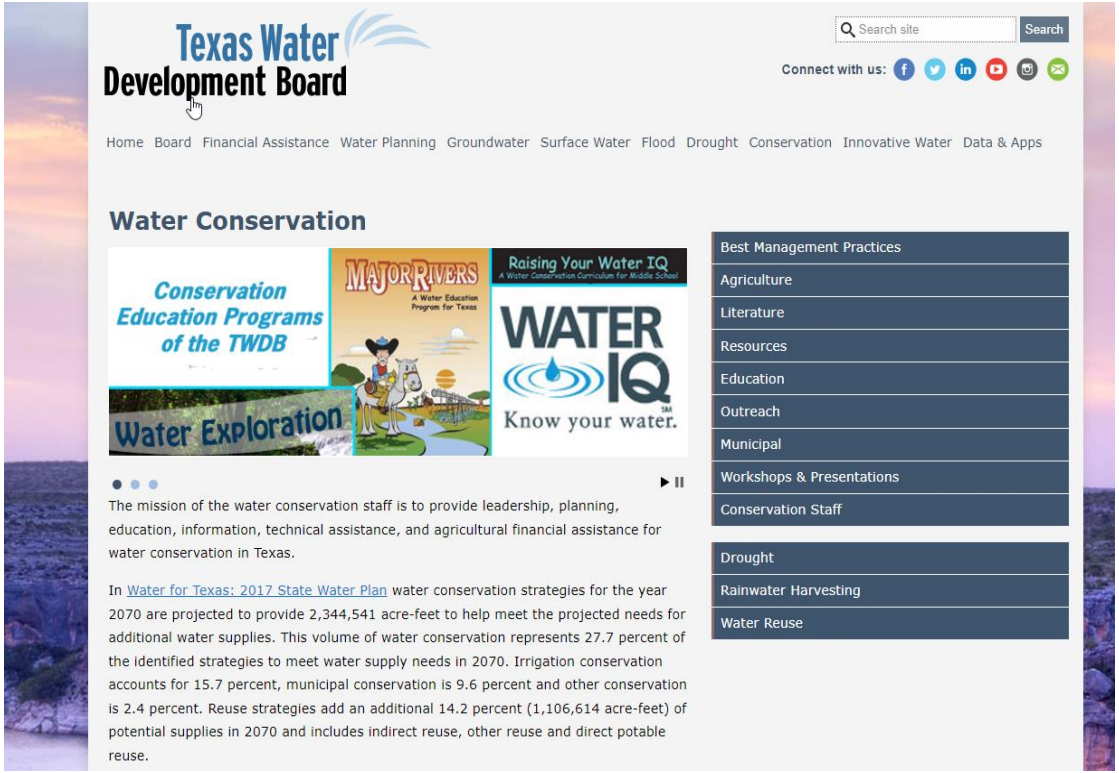
Amistad remained at Record Seasonal Lows; Falcon Nudged Up





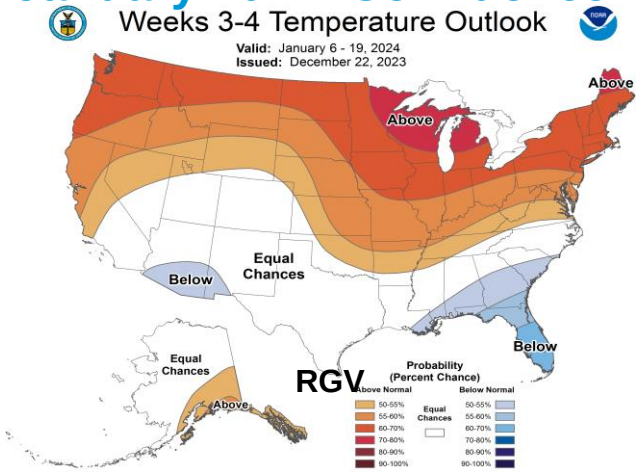
- Minor inflows from late November and early December continued to nudge Falcon up slow rise from **16.2%** to **17.7%** on December 22nd . This level was slightly above record lows for this date, but only a touch above 30-year lows. The potential for additional El Niño-induced rains diminished with this forecast, so a potential rise to **near 20 percent by February** is possible, with medium confidence. **March** rains are highly uncertain – **should thunderstorms develop over the Sierra Madre and help inflows, rises could increase further**. **Without these storms, increasing evaporation rates could actually drop/hold levels in the upper teens**.
- Amistad continued its slow drop into December, **down to 27.2%** on December 22 from **27.6%** Still **extremely (and record) low**. El Niño-induced rains may continue to miss this reservoir and inflow regions into early spring, **leaving levels below 30 percent.**

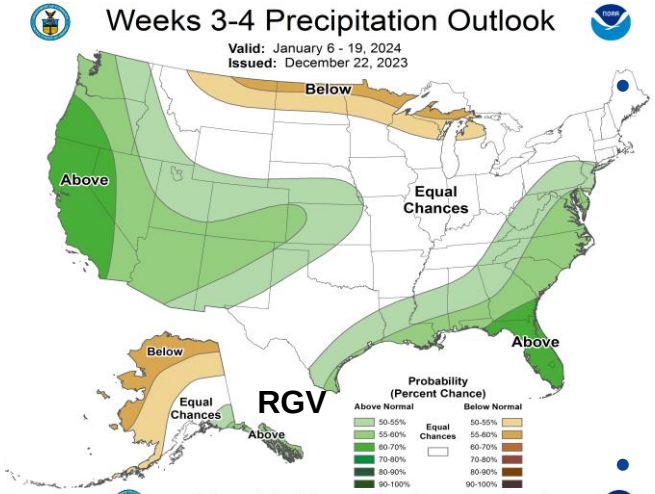
Water Conservation is Key Until Further Notice!

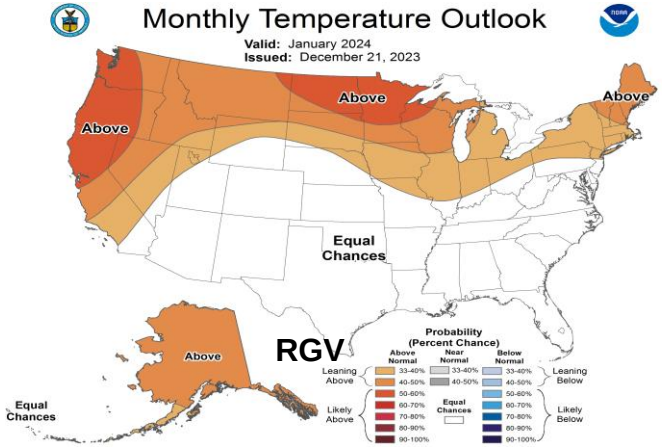


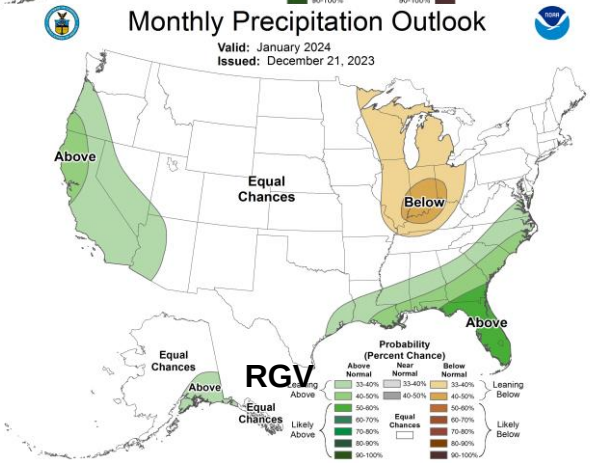
- "Stage 2" Restrictions continued through early winter and are likely to continue through at least March, based on inflows from Amistad and Falcon.
- Learn more at the Texas Water Development Board's Conservation Page

January 2024: Confidence: Medium on Rainfall





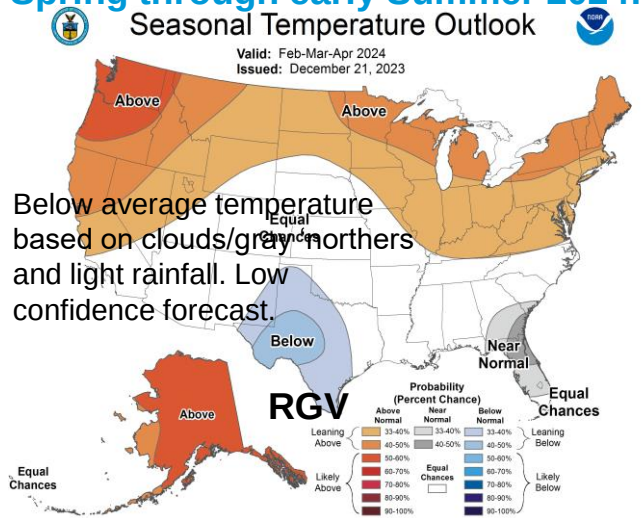




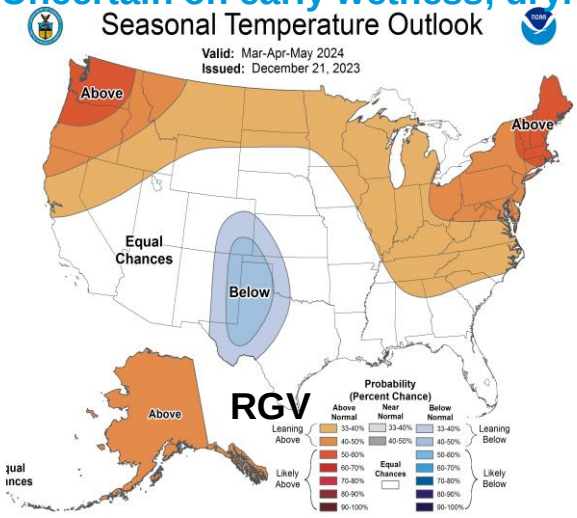
Bottom Line: The pattern will remain changeable, with more fronts and the potential for light to moderate rain events interspersed with warm and sunny periods. An instance or two of colder air across the western Canadian Prairies could bring one or two minor freezes as the airmasses surge southward.

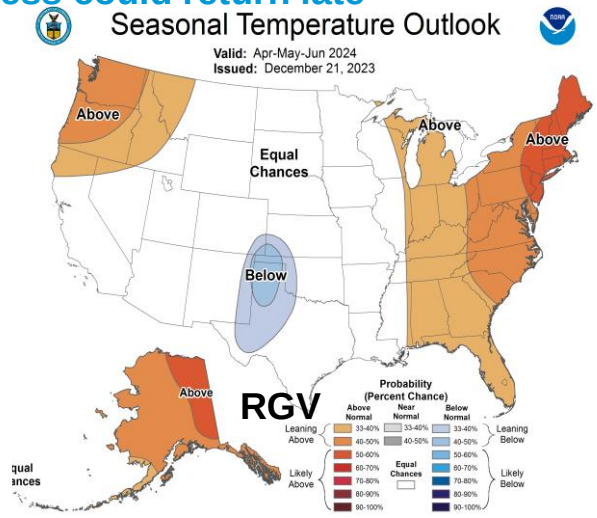
Confidence is **medium for** rainfall in January for the RGV. Rain events associated with upper level disturbance in the southern jet stream that tap the rich tropical moisture of the eastern tropical Pacific **could quickly push values above monthly averages** (Around 1 inch), while stronger fronts could push moisture away and be **followed by up to ten days of dry air, reducing monthly rain to below average.**

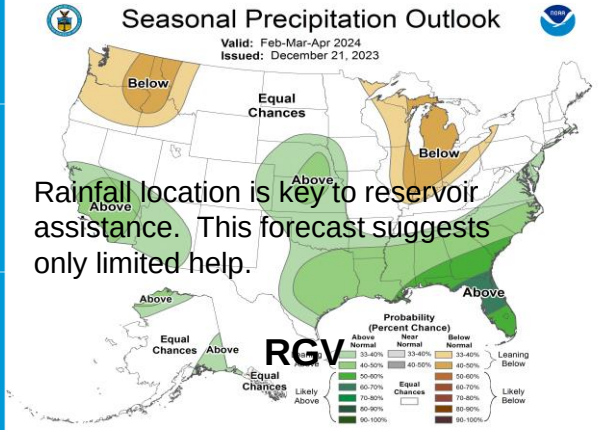
Spring through early Summer 2024: Uncertain on early wetness; dryness could return late



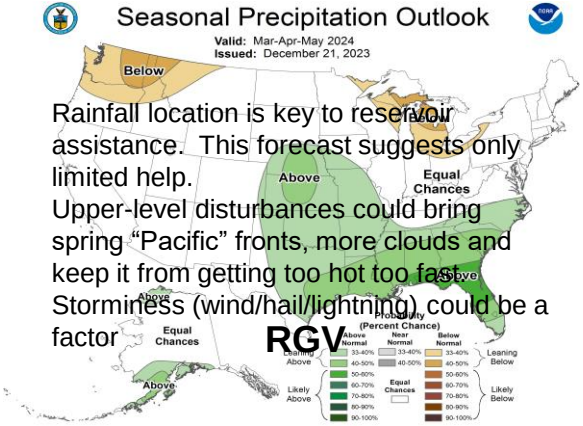
Below average temperature based on clouds/gray northers and light rainfall. Low confidence forecast.



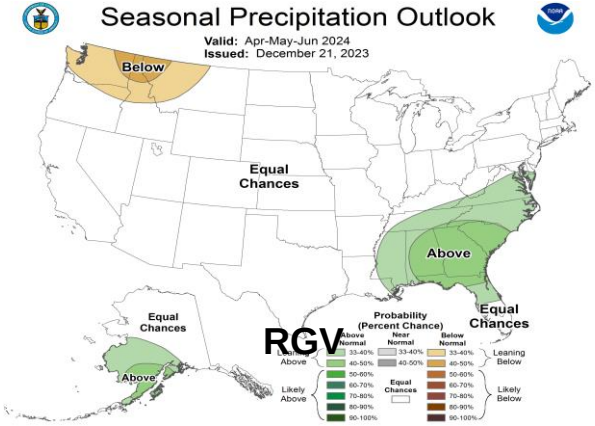




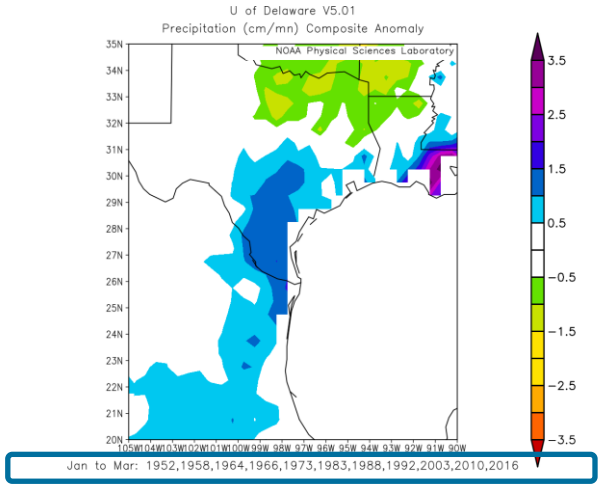
Rainfall location is key to reservoir assistance. This forecast suggests only limited help.



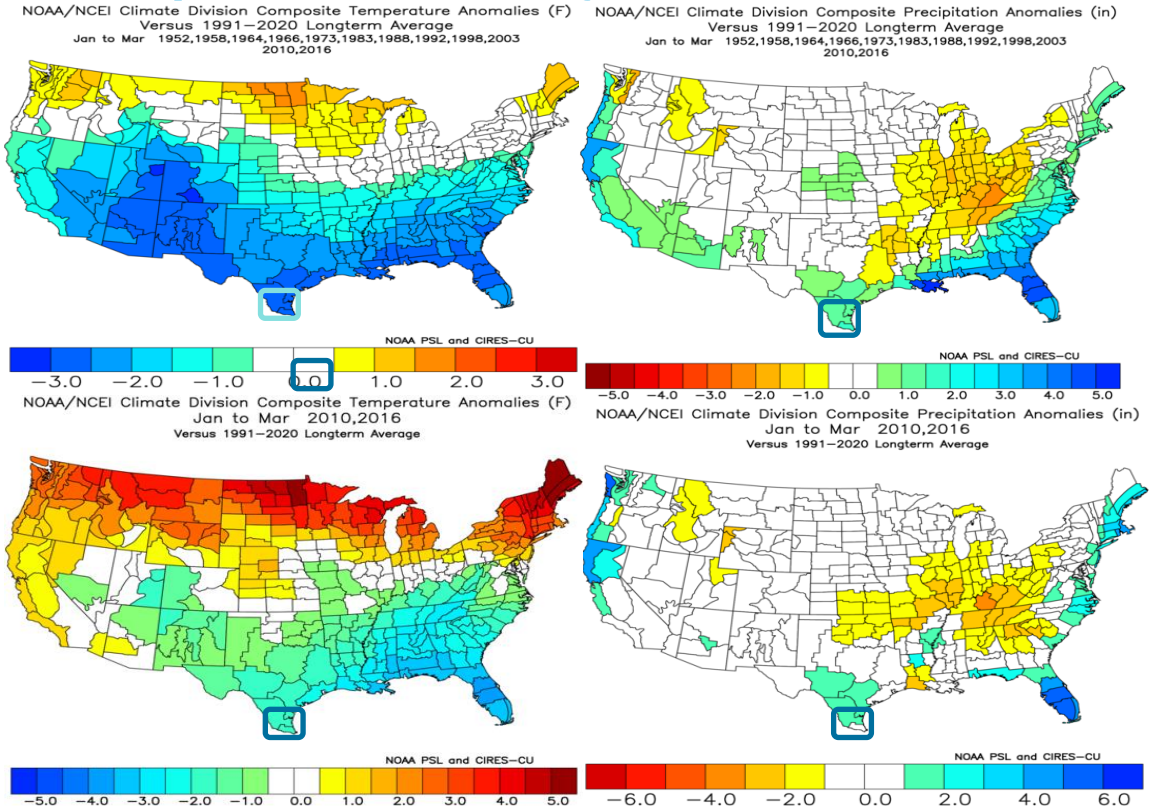
Rainfall location is key to reservoir assistance. This forecast suggests only limited help.
Upper-level disturbances could bring spring "Pacific" fronts, more clouds and keep it from getting too hot too fast.
Storminess (wind/hail/lightning) could be a factor



Comparing Similar El Niño Episodes; January-March Periods



Composite departure from average rainfall for years where the Oceanic Niño Index (ONI) increased to moderate (1 to 1.4), strong (1.5 to 1.9), or "super" (≥2.0) levels prior to the January-March window. Cutoff of rainfall on the coast is a map (mask) issue; the anomaly extends to the coast.



- **Top:** Composite temperature (left) and precipitation (right) anomalies for moderate/strong/"super" El Niños leading into January-March, since 1950.
- **Bottom:** Same, except for most recent cases (2009/10 and 2015/16).

Bottom Lines

- Sufficient inflows from Mexican reservoirs serving the Lower Rio Grande watershed remain unlikely during the January-March 2024 period. **Combined share of water in Amistad and Falcon should continue at or below Stage 2 triggers (25% or less) through March.** Water **conservation, smart irrigation , and rainwater harvesting** are critical actions to continue.
- There will be **cold fronts and cold snaps**, likely to favor occasional, rather than frequent, chilly drizzle events, through mid March. Sharp changes of 30 to 50 degrees (apparent temperature change) from day to day are likely on one to three more occasions. **Through mid/late February**, "Feels like" temperatures **could occasionally dip to or below 30**. A hard freeze is unlikely, but one to three freezes are possible – higher numbers across the Brush Country/King Ranch.
  - Pelicans roosting Bahia Grande north of the Gayman Bridge along SR-48 could be impacted following sharp 'northers through January, when accompanied by light rain/drizzle.
- **Drought Improvements should hold through January.** Future evolution will depend on rainfall directly on the RGV. Atmospheric moisture feeds along fronts would maintain no dryness/drought. However, fronts with limited moisture followed by prolonged spells of mild to warm weather with low humidity would return dryness (Level "0" of 4) or even moderate drought (Level 1 of 4) by mid February into March. Confidence is low on which outcome occurs. Initial dryness would spread from the Rio Grande Plains toward the mid-Valley.
- **Severe Weather? March** offers the best opportunity, as surface temperatures warm with the sun and instability could increase. Much would depend on an active subtropical jet stream linking up with stronger mid-latitude systems. Typical March threats would be **hail,** followed by **flooding rain** and **damaging wind**. Confidence is low.